

Canberra Botanic Gardens

GROWING NATIVE PLANTS

Vol. 8, 1978



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Lambertia formosa

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WINTER COLOUR

When designing a garden in any climate home-owners should endeavour to have flowers at all times of the year. In regions with a climate similar to Canberra, for example, flowers are essential to brighten the bleak winter months. While winter is a period of dormancy for most plants, some use this time of the year to show their full glory.

Some Australian plants flower during winter and winter colour may also be achieved by utilising the red or purplish tints attained by some species in the cooler months. Winter-flowering species are available to fill a wide variety of situations in the home garden and public landscaped areas.

The following species have performed well in Canberra Botanic Gardens and should be suitable for any region with a similar climate.

Acacia beckleri Refer *Growing Native Plants*, Vol. 6, p. 145.

Acacia genistifolia (syn. *A. diffusa*) occurs naturally in Canberra Botanic Gardens and is found in similar dry forest habitats in New South Wales, Victoria and Tasmania. It forms a fairly open shrub 1-2 m tall. Its phyllodes or 'leaves' are pungently pointed and hence it

would make a good 'deterrent' shrub for areas where foot traffic is undesirable. The flowers are pale yellow in colour and occur from early winter through to spring. *A. genistifolia* resents too much water so a drier, well-drained situation in semi-shade to full sun, in light or slightly heavy soils, would suit this plant. Light pruning can be carried out after flowering to keep the shrub more compact. Propagation is from scarified seed. Some scale insects have been noted and die-back may occur if the soil is too moist.

Acmena smithii is widely cultivated in the milder coastal areas of Australia. However, given shelter from cold winds and direct frost, good summer moisture and a reasonable soil, there is no reason why *A. smithii* should not become more common in cooler climates. It is slightly frost tender when young and should be covered in the colder months until established. In its natural environment of coastal New South Wales, Queensland and rainforest pockets in Gippsland, Victoria, it can reach 20-30m tall but usually is smaller in cultivation.

The flowers are white and fairly inconspicuous but the tree is mainly grown for the 12 mm-diameter white, lilac or purple fruits borne in profusion during the winter months. The foliage is also attractive being a shiny, deep green. It is an extremely useful ornamental or shade tree in slightly milder climates. *A. smithii* can be grown from cuttings and this is the most desirable method so that the best or preferred fruit colour is preserved. The plant suffers from scale and the resultant sooty mould but this is easily controlled with a mixture of Malathion and white oil.

Banksia ericifolia (heath banksia) is found naturally on acid, sandy coastal heaths of New South Wales and has reached 4-5 m high in Canberra. It usually remains fairly dense to ground level without any special attention. The shrub itself looks very attractive with fine, bright-green foliage. *B. ericifolia* is adaptable to a variety of situations from moist to fairly dry and semi-shade to full sunlight but the best is a moist, well-drained sunny position. The flowers are very large, up to 25 cm long, and are orange to gold in colour. The flowering season extends over a long period from April to October. Spent flower heads should not be removed from banksias, as these add to the character of the plants. Pruning is not necessary unless a hedge is desired. *B. ericifolia* takes pruning very well and forms a good tall hedge. Propagation is by seed which is fairly quick to germinate but seedlings can be set back at transplanting. Direct sowing of the seed into a pot may overcome this problem. No serious pests have been noted and this species is a favourite of the honeyeaters.

Acacia genistifolia





Acmena smithii

Lambertia formosa



Banksia integrifolia (coastal banksia or honeysuckle) is another coastal species found in New South Wales, Queensland and Victoria; it grows to a large size in Canberra, the biggest in Canberra Botanic Gardens being 6 m tall and 3 m wide. The distinctive leaves of this species are bright green above and whitish below and usually grow in whorls of four around the stem. *B. integrifolia* grows quite rapidly in cultivation, preferring a well-drained but moist position in full sun. Flowers are straw yellow in colour and are found mainly in June to August, with odd flowers at other times of the year. Once again pruning is not essential other than to correct straying branches. Propagation is carried out by seed. Small attacks by scale are easily brought under control. It is resistant to salt spray.

Banksia serrata (saw banksia or old man banksia) grows on coastal sand dunes and sandy woodland areas near the NSW coast. This is the *Banksia* symbolized as the 'Banksia Man' in Mae Gibbs' famous Australian children's story *Snugglypot and Cuddlepipie*. The largest specimen in Canberra Botanic Gardens is some 7-8 m tall and 3 m wide. It grows slowly in Canberra conditions but the species flowers while fairly small and is well worth planting for its huge flower spikes. The leaves are a bright, glossy green in colour with 'saw-tooth' or serrated margins. Cylindrical flower spikes are up to 16 cm long by 10 cm diameter and are greenish yellow in colour. The flowering period is from March to July. Pruning is undesirable as the plant should be left to attain its natural gnarled shape. Propagation is carried out by seed and no pests of a serious nature have been noted.

Callitris macleayana (native pencil pine, refer *Growing Native Plants* Vol. 6 plate p. 124) is found on the north coast of NSW in a few confirmed localities. It grows slowly in Canberra and has a narrow columnar habit. During the cooler months of May to October the foliage turns a beautiful coppery colour. Some plants at Canberra Botanic Gardens are growing well in a heavy soil usually fairly moist. The species can adapt to a number of situations so long as water is adequate during the drier months. Propagation is normally by seed and some success can be had with cuttings taken with a heel. Pruning should be unnecessary other than to correct straying branches. One serious pest, the *Callitris* sawfly, attacks *Callitris* species in general and a small number can quickly defoliate a tree. The green larvae have black heads and are easily recognised.

Casuarina torulosa (forest oak) from NSW and Queensland is one of the most desirable *Casuarina* spp. for garden cultivation. Plants

reach about 5-6 m tall. During the colder months the branchlets are toned in a purplish hue from crown to ground level; their tips may suffer from frost burn during severe frosts. *C. torulosa* plants appear to thrive best in a well-drained soil in a semi-shaded to open position. In Canberra Botanic Gardens some plants have suffered from dieback (suspected as *Phytophthora cinnamomi*) but have recovered satisfactorily. Propagation is by seed which germinates and transplants well. This species of *Casuarina* seems to have a weak stem when young and may need to be staked until established.

Crowea saligna occurs naturally in the Hawkesbury sandstone areas of NSW and is a spreading shrub of some 1 m by 1 m. The foliage is deep green in colour and the flowers, found during June and July, deep pink. This species grows naturally in shady situations with a reasonable amount of protection from other shrubs. This situation also applies in cultivation with the best plants growing on a well-drained slope with filtered sunlight. A cool root-run is fairly important, as with most members of the Rutaceae family. This species can be pruned quite heavily for cut flowers or after flowering, the bush re-shooting well and remaining fairly compact. Propagation is usually carried out by medium wood cuttings from December to February. No major pests have been noted.

Cryptandra amara occurs naturally in the ACT as well as in Queensland, NSW, Victoria, South Australia and Tasmania. It is a low-

growing plant to 0.5 m tall by 1 m wide and could be used to good advantage in a rockery situation. The flowers are white to cream and are found during winter and spring. To some they are fragrant, to others sickly sweet. *C. amara* prefers drier, heavy soils in full sunlight though it is adaptable to lighter soils as long as water is available in summer. Propagation is best by cuttings as some plants are definitely superior to others in flower production.

Hakea purpurea is from the drier areas of NSW and Queensland and in its natural habitat grows from 1-2 m high in open situations or under trees. It enjoys much the same sort of position in cultivation, that is, full sun to semi-shaded. It is usually suggested that good drainage is essential for this species but the plants growing at Canberra Botanic Gardens are 1-1.5 m tall and growing in heavy soil that holds moisture for a reasonable time. The flowers of *H. purpurea* are a deep purple-crimson and open in June and July. The terete leaves are divided once or twice and sharp pointed. It tolerates pruning and garden-grown plants are long-lived—pruning may help in this respect. Propagation is normally carried out by seed but some return could be expected from medium wood cuttings taken from November to February. Some plants at Canberra Botanic Gardens have suffered a small amount of dieback but are recovering.

Lambertia formosa commonly known as the mountain devil or honey flower, is found over a wide range of the Hawkesbury and Narrabeen sandstones of NSW. The common name,

Correa pulchella





Thryptomene calycina

mountain devil, arises because its seed capsules resemble a devil's face with horns and a long, pointed snout. It is usually an erect shrub to 2 m tall. Many stems arise from the lignotuber at ground level. The flowers are tubular in shape, terminal on the branches, and red and gold in colour. They are found mainly from August to December although odd flowers can be seen all year. In cultivation a moist, well-drained soil in full sun would suit this species. Pruning is desirable as it induces more lateral growth and more stems to arise from the lignotuber, thus giving more flowers. Flowers can be cut for indoor use as they last well. Propagation is best by seed though the plant is fairly slow to reach the flowering stage. No serious pests have been noted. Small outbreaks of scale and sooty mould are readily controlled with Malathion and white oil.

Melaleuca decussata is naturally found in damp situations on stream banks or wet flats in north and south-west Victoria and southern parts of South Australia, but in cultivation it also tolerates quite dry areas. The shrub performs better when water is applied during the drier months. It is quite hardy in Canberra and grows to a dense shrub some 2 m tall and 2.5 m across. The flowers are lilac to pink in colour and are found from August to February. Unfortunately they fade quickly after opening. This species can be used for hedges and tolerates pruning. The plant prefers an open position in full sun. Propagation is by seed or cuttings but cuttings should be preferred so that the best forms are preserved.



Brachysema latifolium

Name meanings

Acacia genistifolia: *Acacia*—may be from the Greek to sharpen, in reference to the prickly nature of the first species discovered; another opinion refers to the Egyptian thorn (akakia), a species of *Acacia* which yields gum arabic; *genistifolia*—from the Latin, with leaves like a *Genista*

Acacia podalyriifolia: *podalyriifolia*—with leaves like *Podalyria*, a pea plant; *folium*, a leaf

Acmena smithii: *Acmena*—from the Greek, *acmenae*, the nymphs of Venus who had an altar at Olympia; *smithii*—after J. E. Smith, a 19th century Australian botanist

Banksia ericifolia: *Banksia*—after the British naturalist, Sir Joseph Banks (1743–1820); *ericifolia*—from the Latin, with leaves like an *Erica*

Banksia integrifolia: *integrifolia*—from the Latin, with entire leaves

Banksia serrata: *serrata*—from the Latin, meaning having serrated leaves

Brachycome multifida: *Brachycome*—from the Greek, *brachys*, short, and *kome*, a head of hair, referring to the short pappus; *multifida*—from the Latin alluding to the much divided leaves

Brachysema latifolium: *Brachysema*—from the Greek, *brachys*, short, and *sema*, standard (alluding to the pea flowers); *latifolium*—from the Latin, *latus*, board, and *folium*, a leaf

Callitris macleayana: *Callitris*—from the Greek, *kallos*, beautiful, and *trois*, three, referring to groups of leaves; *macleayana*—after the British naturalist, William Macleay (1792–1865)

Casuarina torulosa: *Casuarina*—from the Latin, *casuarius*, because the foliage resembles the drooping feathers of a cassowary; *torulosa*—from the Latin, *torulosus*, cylindrical, with bulges at intervals, that is, where leaves arise in whorls around the stem

Correa pulchella: *Correa*—after Jose Francisco Correa de Serra (1750–1823), a Portuguese botanist; *pulchella*—from the Latin *pulchellus*, meaning beautiful but small

Crowea saligna: *Crowea*—after an English botanist, Dr James Crowe (1750-1807); *saligna*—from the Latin, salignus, willow-like

Cryptandra amara: *Cryptandra*—from the Greek, crypt, covered or hidden, and andria, anthers, referring to the hooded petals covering the anthers; *amara*—from the Latin, amarus, bitter

Grevillea aspera: *Grevillea*—after C. F. Greville (1749-1809), an English patron of botany; *aspera*—from the Latin, asperatus, meaning rough with hairs or points, an allusion to the foliage

Hakea purpurea: *Hakea*—after Baron Von Hake, a patron of botany in the 18th century; *purpurea*—in reference to the purplish colour of the flowers

Lambertia formosa: *Lambertia*—after A. B. Lambert (1761-1842), a distinguished patron of botany; *formosa*—from the Latin, formosus, beautiful

Melaleuca decussata: *Melaleuca*—from the Greek, melas, black, and leukos, white, as the first *Melaleuca* described had white branches against a black trunk possibly blackened by fire; another opinion contrasts the white bark with the very dark foliage; *decussata*—from the Latin, referring to the arrangement of the leaves which are divided crosswise in pairs alternately at right angles

Thryptomene calycina: *Thryptomene*—from the Greek, thrypto, to break or crush, alluding to the humble heath-like aspect of the plant; *calycina*—from the Latin, calycinus, referring to the nature or form of the calyx



Top: *Acacia podalyriifolia*

Middle: *Grevillea aspera*

Bottom: *Brachycome multifida*



Winter flowering plants in Canberra Botanic Gardens

Name	Season	Colour	Height m	Ref. in <i>Growing Native Plants</i>
<i>Acacia baileyana</i>	Aug.-Sept.	Bright yellow	6-8	Vol. 6, p. 145
<i>Acacia beckeri</i>	May-July	Bright yellow	0.3-3	
<i>Acacia genistifolia</i>	June-Sept.	Pale yellow	1-2	
<i>Acacia mearnsii</i>	Aug.-Nov.	Yellow	4	
<i>Acacia podalyriifolia</i>	Aug.-Oct.	Yellow	7	
<i>Acacia retinodes</i>	Most of year	Yellow	5-6	
<i>Acacia ulicifolia</i>	June-Sept.	Cream to yellow	1-2	
<i>Acmena smithii</i>	Winter	White, pink or purple berries	10	
<i>Agonis juniperina</i>	April-Oct.	White	5	Vol. 3, p. 56
<i>Albizia lophantha</i>	July-Aug.	Green	4 +	
<i>Astartea fascicularis</i>	Most of year	White or pink	1	Vol. 2, p. 47
<i>Banksia ericifolia</i>	April-Oct.	Orange-gold	3-5	Vol. 1, p. 5
<i>Banksia integrifolia</i>	June-Aug.	Straw yellow	5-12	Vol. 1, p. 6
<i>Banksia robur</i>	April-Aug.	Greeny-yellow	2-5	Vol. 6, p. 143
<i>Banksia serrata</i>	March-July	Greeny-yellow	6-8	
<i>Banksia spinulosa</i>	May-Dec.	Gold	2	Vol. 7, p. 172
<i>Bauera rubioides</i>	Aug.-Jan.	White or pink	2	Vol. 3, p. 69
<i>Brachycome multifida</i>	Most of year	Blue-mauve	0.3	
<i>Brachysema latifolium</i>	May-July	Orange-red	prostrate	
<i>Callitris macleayana</i>	May-Sept.	Coppery foliage	5	Vol. 6, p. 122
<i>Casuarina torulosa</i>	May-Sept.	Foliage with purple tonings	6-10	Vol. 3, p. 55
<i>Correa pulchella</i>	June-Aug.	Red	0.3-0.7	
<i>Correa reflexa</i>	May-Nov.	Yellows, greens, red plus mixtures	0.3-2	Vol. 7, p. 161
<i>Crowea exalata</i>	June-Sept.	Bright pink	1	Vol. 3, p. 59
<i>Crowea saligna</i>	Most of year	Deep pink	1.5	Vol. 3, p. 59
<i>Cryptandra amara</i>	June-Sept.	White	0.5	
<i>Darwinia citriodora</i>	Aug.-Nov.	Red and green	1	Vol. 8, p. 186
<i>Epacris impressa</i>	May-Nov.	White to deep red	0.3-1	
<i>Grevillea alpina</i>	Aug.-Oct.	Orange reds	0.3-1	
<i>Grevillea aspera</i>	July-Aug.	Red and cream	0.3-1	
<i>Grevillea baueri</i>	April-Nov.	Red-crimson	2	Vol. 1, p. 17
<i>Grevillea fasciculata</i>	Most of year	Yellow styles/red	1	
<i>Grevillea juniperina</i>	Most of year	Red-cream	pos. 2	
<i>Grevillea lavandulacea</i>	July-Dec.	Pink-red	1	
<i>Grevillea oleoides</i>	Most of year	Bright red	1-2	Vol. 2, p. 42
<i>Grevillea rosmarinifolia</i>	Most of year	Red-cream-pink- scarlet	1-2	
<i>Grevillea thelemanniana</i>	April-Oct.	Red	pos. 1	
<i>Grevillea victoriae</i>	Dec.-July	Brownish red	2-5	
<i>Hakea eriantha</i>	Aug.-Nov.	White	5	
<i>Hakea laurina</i>	May-Aug.	Red and creamy white	4-5	Vol. 2, p. 39
<i>Hakea purpurea</i>	July-Nov.	Bright red	1.5	
<i>Hakea sericea</i>	May-Oct.	Cream-pink	5	Vol. 3, p. 57
<i>Hakea verrucosa</i>	Aug.-Nov.	Red, white and yellow	2	Vol. 4, p. 89
<i>Lambertia formosa</i>	Aug.-Dec.	Red and gold	2	
<i>Leptospermum scoparium</i> cv.	April-Dec.	Pink-mauve	1-2	
<i>Melaleuca decussata</i>	Aug.-Feb.	Pale lilac	3.5	
<i>Melaleuca nodosa</i>	Aug.-Oct.	Cream	2	
<i>Thryptomene calycina</i>	July-Oct.	White, pink	1	Vol. 1, p. 23

THE USE OF TISSUE CULTURE

Tissue culture, a new and exciting field of plant propagation, is a process whereby minute pieces of plant tissue, such as buds and leaf tips, are taken and caused to develop into whole plants. Its potential as a propagation method is enormous and a great deal of research work is being carried out throughout the world in developing it as a method of propagating a wide range of plants, from ferns to trees.

Tissue culture has perhaps reached its highest level of development in the commercial propagation of orchids. It provides a method for the rapid vegetative propagation of selected hybrids. In this work buds, leaf tips, root tips and flower stalk slices have all been successfully employed to produce new plants.

In general, plants may be produced by tissue culture by using one of two pathways (Fig. 1). Both involve the sterilisation of the plant

material as the first step. In the first pathway the tissue produces callus tissue, a mass of undifferentiated cells. This callus is increased in volume by sub-culture. When sufficient callus is produced it is placed on a different medium which stimulates differentiation and the production of shoots. In most cases a third medium is employed to form roots. In the second pathway the formation of callus tissue is avoided and the direct formation of shoots encouraged. In this second method a smaller number of plants is produced from a given piece of tissue but at a quicker rate. There is also less chance of genetic variation.

Research into the use of tissue culture for the propagation of Australian plants commenced at Canberra Botanic Gardens about four years ago. To date this research has concentrated on the kangaroo paws (*Anigozanthos* spp. and *Macropidia fuliginosa*). While most species in the genus *Anigozanthos* can be readily propagated from seed, some of the hybrids, which have been produced in an effort to increase resistance to inkspot disease or to improve flowering form, cannot be propagated in this way.

Macropidia fuliginosa, a closely related species of horticultural merit, is also difficult to grow from seed. These plants cannot be propagated from cuttings and division does not permit large-scale propagation. Tissue culture would appear to be the answer. Recently *Anigozanthos flavidus*, *A. manglesii* and *Macropidia fuliginosa* have been successfully produced by tissue culture. The method which has been developed uses lateral buds taken from the base of the stem. These are sterilised and placed on a shoot-initiating medium.

Within five to ten weeks multiple shoots are formed (Fig. 2) which can be subcultured to produce a large number of shoots. At this stage the shoots are separated and placed on a rooting medium. The rooted plantlets are potted up and hardened off slowly in a glasshouse under mist. It is hoped to extend this work to hybrids and cultivar forms of this genus.

Recently research has begun on the tissue culture of native ferns, several terrestrial orchids and the Western Australian pitcher plant (*Cephalotus follicularis*).

The potential use of tissue culture in the propagation of Australian native species remains largely untapped. A number of individuals and nurseries throughout Australia are, however, becoming aware of its potential and are undertaking research. If the overseas trend is a guide we can expect tissue culture to play a role of growing significance in the propagation of horticulturally desirable Australian species.

Anigozanthos flavidus showing area from which the meristematic tissue is obtained



Fig. 1 Two possible pathways in the propagation of plants by tissue culture

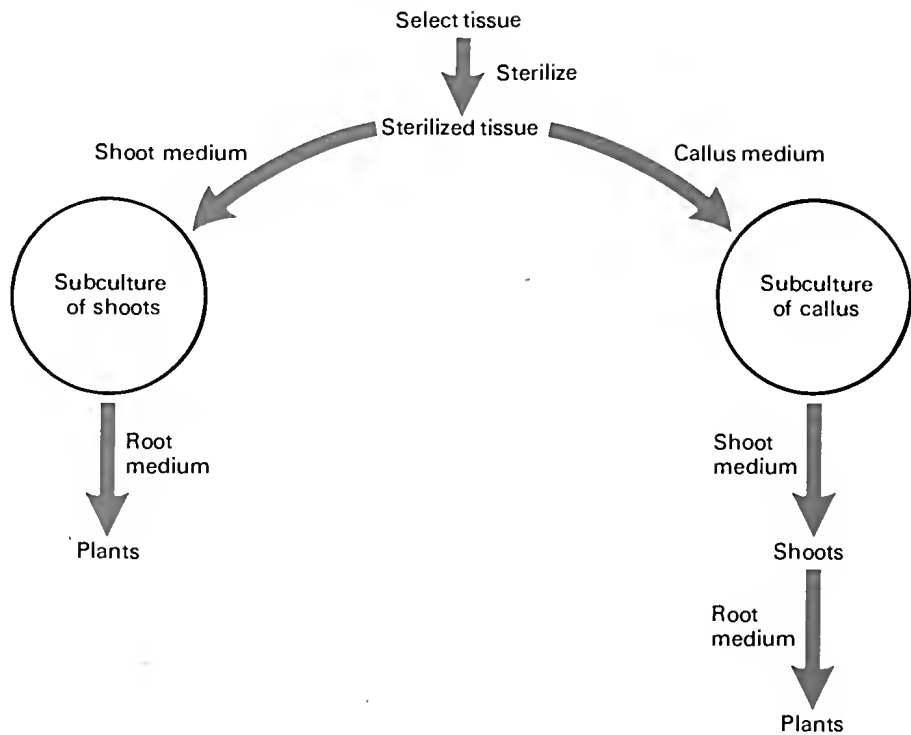
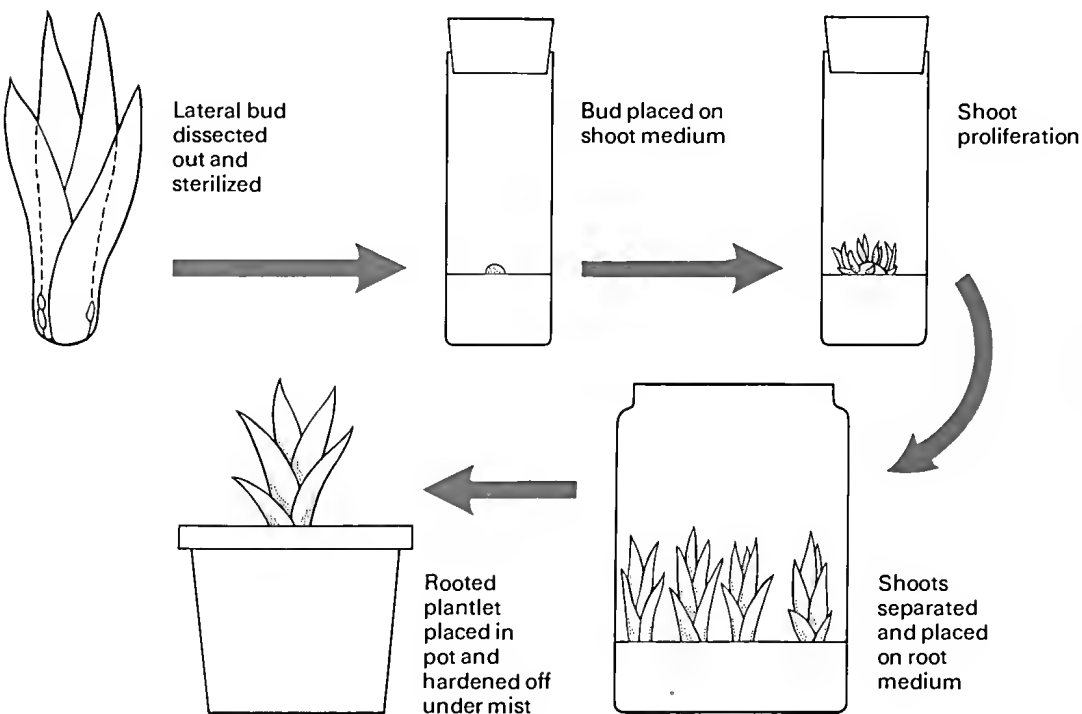


Fig. 2 Steps in the tissue culture propagation of *Anigozanthos* spp.



DARWINIA CITRIODORA

About seven species of *Darwinia*, a member of the family Myrtaceae, occur in the eastern States and South Australia. *D. citriodora* is, however, along with more than twenty others, endemic to Western Australia occurring in the Darling, Warren and Stirling districts of the south-west province, from the Swan River to King George's Sound, and eastward to Cape Riche—a region of essentially winter rainfall.

It grows to a height of between 1 m—1.5 m with a similar spread, forming a compact rounded shrub. The leaves are most attractive, colouring during winter with traces of purple-red which accentuate the venation of newer leaves. They are usually rich green, 6 mm to 12 mm long varying from oblong to almost

Darwinia citriodora: *Darwinia*—after Dr Erasmus Darwin (1731–1802), the grandfather of the famous evolutionist, Charles Darwin; *citriodora*—of Greek origin and meaning lemon-scented

lanceolate with blunt ends and curved back margins; they are arranged nearly opposite in pairs along the stems. The underside of the leaves is distinctively marked with numerous oil glands and when crushing stems or leaves between the fingers a pleasant lemon scent is given off. This scent gives rise to the common name, lemon-scented myrtle.

D. citriodora flowers from July to January or even longer but the blooms are not particularly striking. They are borne in slightly pendulous terminal clusters of four, or sometimes five or six, each with a prominent style about 1 cm long and curved at the tip towards the centre of the cluster. As the styles mature a change in colour may occur from yellow with red stigmas to orange-red.¹ The corolla segments are small and yellow with a tinge of red and enclose the ten short stamens which bear globular anthers. The corolla is in turn enclosed by eight red-green, leaf-like bracts. It is these prominent bracts and long protruding styles which give character to the flowers.

It adapts reasonably well to Canberra's soil and climatic conditions although protection from frost is advisable, especially while the plant is young; adequate summer water is necessary. A warm position in semi-shade will suit, but if it is too heavily shaded pruning may become necessary because the resultant growth may be elongated and sparse. Normally no pruning is needed apart from an occasional 'tipping' of shoots following flowering. The normal practice of applying an artificial general fertilizer (NPK 10 : 9 : 8) in early spring will produce good results as will well-rotted animal manures lightly worked into the soil around the plant's root zone. A mulch of leaves, bark, rotted grass clippings or similar material applied after spring fertilising will conserve soil moisture during summer. The plant seems to be free of serious disease and insect pests.

Propagation is easy from firm tip-cuttings taken at any time, though best results are obtained at the end of summer or early autumn. Rooting hormone, though not essential, can be applied to the base of the cuttings before they are placed in a rooting medium consisting of a mixture of 75% sand and 25% peat moss. Regular applications of liquid fertilizer, such as Aquasol, are beneficial after cuttings have rooted.

Darwinia citriodora is perhaps best utilised as a foliage plant in groups of three or more. Its winter colouring, attractive lemon-scented foliage and the fact that it is virtually pest-free make it an ideal plant for this purpose.

¹RHS Colour Chart, 1966: styles, orange-red group 34A; corolla and calyx, yellow group 10A to red group 39B; bracts, red group 50B to green group 137C.



PATERSONIA

spp.

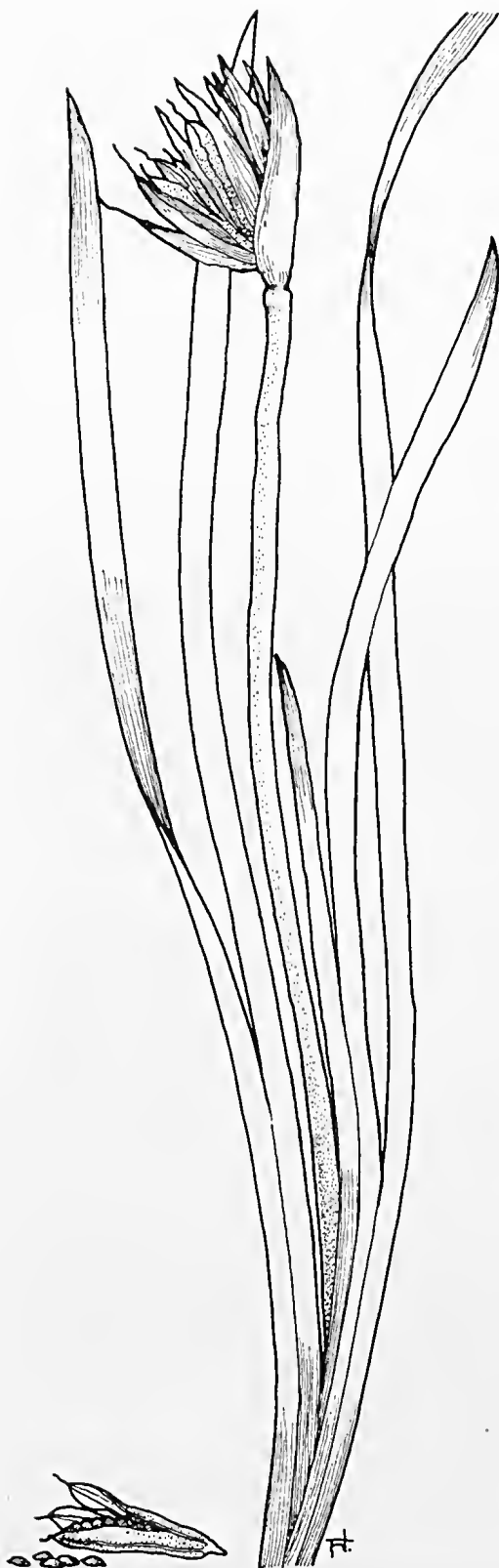
Patersonia sericea: *Patersonia*—in honour of Col. W. Paterson (1755–1810), Scottish traveller in South Africa in the 18th century; *sericea*—Latin for pressed silky hairs referring to the silky hairs of the plant

The genus *Patersonia* includes about twenty species of small strap-leaf plants resembling the exotic iris whose family, Iridaceae, is not well represented in Australia. As a result members of the genus *Patersonia* are frequently referred to as native iris or flag.

They can be found over most of temperate Australia and make showy rockery plants either singly or en masse. They need good drainage and a full sun although there are one or two exceptions to this general rule which will be dealt with later in this article.

They are erect herbs with short rhizomes, linear leaves and regular three-petalled flowers in terminal clusters enclosed in two large papery bracts. The flower colour varies with the species—white or yellow is rare and usually they are blue through purple with soft delicate petals.¹ Individual flowers open for less than one day but many flowers are produced from the one stem. All plants in a





Patersonia longiscapa: *longiscapa* — long-stalked

single area will flower on the same day making an impressive display when massed.

The fruit is a long, three-celled capsule triangular in cross section with abundant seed which germinates readily with no special treatment. Young plants should be planted out at 30-40 cm centres. Some success has been achieved by dividing clumps, but this is not a reliable method of producing new plants. All are moderately frost tolerant.

Patersonia fragilis has greyish-green, twisted leaves to 45 cm, often longer than the flower stem which bears blue flowers. As yet this species has had limited success in Canberra Botanic Gardens but a sandy soil and better drainage may improve its performance. It may be found in south-east Australia from southern Queensland to South Australia including Tasmania.

P. glabrata from Queensland, New South Wales and Victoria is recommended as a rockery plant in a sunny situation. It has erect, dark-green leaves 15-30 cm long and blue to light-purple flowers.

P. longiscapa has clear blue to purple flowers held above the linear leaves which form a dense tussock. It is an attractive garden specimen particularly suited to damper areas and does well at Canberra Botanic Gardens. It is a free-flowering species for an open situation and occurs in Victoria, Tasmania and South Australia.

P. longifolia occurs on the coast and adjacent sandstone plateaus from near Sydney to eastern Victoria. It forms a small clump with flower stalks only 15 cm long and is useful as a rockery plant for damp, semi-shaded situations.

P. occidentalis is a frost-hardy plant which can withstand a dry situation and has proved a useful plant at Canberra Botanic Gardens. It is a tall, free-flowering species occurring naturally in south-western Australia. As with other *Patersonia* spp. it flowers in the spring and carries through to early summer. Colour is blue to purple.

P. sericea is another reliable species with attractive silky leaves dark to greyish green. It has deep violet-blue flowers and thrives in hot, dry situations.

P. xanthina, a Western Australian species with yellow flowers in spring, is not common in cultivation and prefers a shaded position with good drainage. Plants have flowered in containers at Canberra Botanic Gardens but have not proved reliable in the open garden.

¹RHS Colour Chart, 1966: *P. sericea*—violet group 87A; *P. longiscapa*—violet group 87A; *P. occidentalis*—violet group 87A; *P. fragilis*—violet group 88D.

HELICHRYSUM BRACTEATUM 'DIAMOND HEAD'

This prostrate form of everlasting daisy or strawflower was found growing naturally at Diamond Head on the mid-north coast of New South Wales and because of its exposed position had developed a stable prostrate habit reducing its overall height to about 16 cm. It is therefore quite distinct from other forms of *Helichrysum bracteatum* and as a result was registered as a cultivar by the Australian Cultivar Registration Authority in March 1977.

Helichrysum bracteatum 'Diamond Head' is a compact perennial herb growing to a height of about 8 cm with a spread of about 45 cm. Leaves are rough, hairy, more or less narrow oblong, and up to 4 cm long. The height of the plant is doubled to 16 cm when the plant is in flower as the bright yellow¹ flower heads are borne on slender stalks 8 cm above the foliage. Each head consists of a number of florets, the outer ones having papery bracts which are the showy part of the flower. Flower heads are about 3 cm across and are seen from October to May.

Its size and habit are ideally suited for its use in a rockery as an individual plant, or alternatively if plants are placed close together it may be used as a dense ground cover. Either way it does best in a light, well-drained soil in full sun.

A new flush of growth is produced when flowering is over in mid-winter. At this time the old season's growth should be pruned back to maintain vigour and a neat appearance.

Although some seed is produced it does not germinate well and a more reliable method of propagation is by means of cuttings. These should be taken when the new tip growth has hardened off slightly in spring. The cuttings should be set in the usual open and well-drained cutting medium (refer *Growing Native Plants* Vol. 2, p. 26).

Helichrysum bracteatum 'Diamond Head' is rarely affected by winter temperatures. If very young tips are burnt after a severe frost the plants will recover quickly. The only other problem is possible damage by aphid and/or thrip. These pests can be readily controlled by spraying with Rogor 40 or similar insecticide.

¹RHS Colour Chart, 1966: ray florets, yellow group 13A; inner florets, orange group 24A.

Helichrysum bracteatum:
Helichrysum—from the Greek, helios, the sun, and chrysos, gold;
bracteatum—from the Latin, bearing bracts, emphasising the fact that the many bracts of the flowers are colourful and resemble petals



ANGOPHORA COSTATA syn. A. LANCEOLATA

The genus *Angophora* is closely allied to *Eucalyptus* (family Myrtaceae) but differs in that it usually has opposite leaves and possesses overlapping, pointed calyx lobes instead of the operculum or lid on the flower buds of eucalypts.

A. costata, or smooth-barked apple, is a large, wide, spreading tree growing to a height of between 15 and 25 m.

The trunk is often gnarled and crooked with a pink to pale grey, sometimes rusty stained, bark. The timber is brittle and limbs tend to fall readily. In nature the butts of such limbs form callused bumps on the trunk and add to the gnarled appearance. The old bark is shed in spring in large flakes with the new salmon-pink bark turning to pale grey before the next shedding. The leaves are dark green, lance-shaped, 6–16 cm long and 2–3 cm wide. They are borne opposite each other on the stem. Venation is regularly parallel at about 80° to the midrib.

The flowers are white¹ and very showy, being produced in large bunches on terminal corymbs or short panicles. The individual flowers are about 2 cm wide with five tooth-like sepals, five larger semi-circular petals, and a large number of long stamens. The seed capsules are goblet shaped, 2 cm long and as wide, often with fairly prominent ribs. The usual recorded flowering time is December or January, but at Canberra Botanic Gardens the species flowers for one month between early January and early February. The tree has a handsome, rugged ornamental appearance and its young red tips are often used in floral arrangements.

A. costata occurs naturally on the sandy soils and stony ridges of southern Queensland forests, extending inland as far as the Warrego district. In NSW it extends from Sydney northwards to the central coast and as far west as Bathurst, being particularly common in Hawkesbury sandstone where it forms almost pure stands. Rainfall in these areas varies between 635–1520 mm.

A. costata is grown from seed which normally germinates after seven days and no special treatment is required. The seed should be sown in a loose, well-drained mix just below the surface. When the seedlings reach a height of 1–2 cm they should be pricked out into a large container until they are large enough to be planted out.

Plants in Canberra Botanic Gardens are doing well in a variety of situations, from well-drained rocky soils to almost boggy conditions. The trees differ in their growth habit some being pyramidal with straight trunks while others have a more branching habit with twisted trunks. Most of the trees were planted in autumn 1971 and in six years have reached heights from 3–8 m. A good example can be seen in the lower carpark area. This particular specimen has five main branches of about 1 m forming a pyramidal tree of around 8 m. It flowered prolifically for the first time in the 1977 summer and then produced masses of seed capsules which were retained throughout the winter.

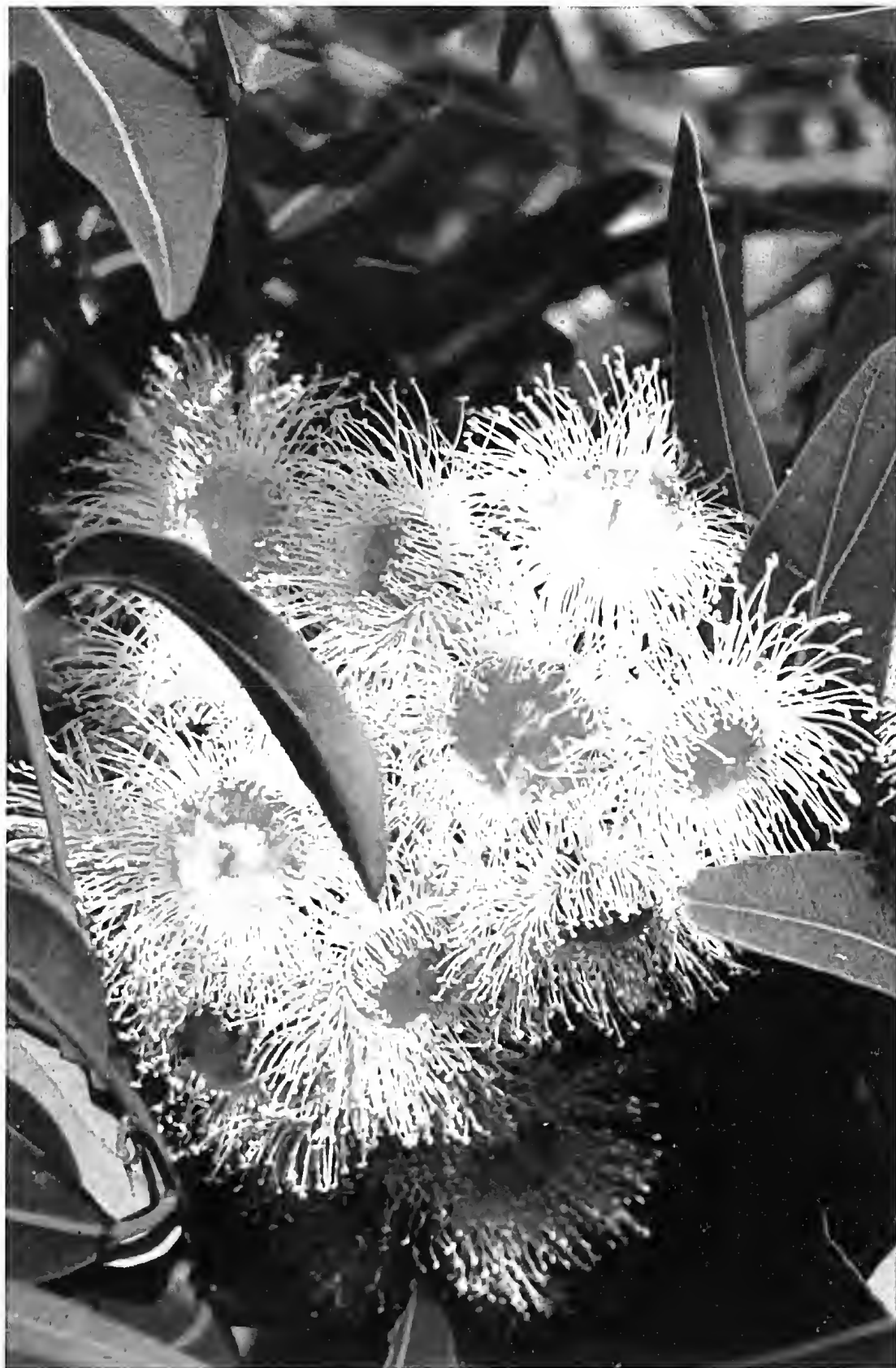
The largest specimen in the Gardens was planted in 1951 and has now reached a height of around 15 m. This is a slender, straight-trunked tree with the lowest branches occurring 3 m from the ground.

Some trees suffer minor frost damage to new tips during winter, and caterpillars and the native leaf-cutting bee cause minor damage to the foliage.

Care should be taken not to position this species where its branches will overhang a house as large falling limbs could cause major damage to the roof.

¹RHS Colour Chart, 1966: yellow group 4D.

Angophora costata: *Angophora*—from the Greek, *angos*, a vessel, and *pheros*, to bear; *costata*—ribbed, an allusion to the longitudinally-ribbed, goblet-shaped fruit of this species



MELALEUCA LATERITIA

Melaleuca lateritia: *Melaleuca*—from two Greek words, *melas*, black, and *leukos*, white, because the first *Melaleuca* described had white branches against a black trunk possibly blackened by fire (another opinion contrasts the white bark with the very dark foliage of some species); *lateritia*—from the Latin meaning brick red, referring to the flowers



Melaleuca lateritia, commonly known as the robin red-breast bush, is one of many beautiful *Melaleuca* spp. native to the south-west province of Western Australia. It is an erect shrub and although rarely exceeding 1.5 m high by 1 m in diameter in Canberra, often reaches over 2 m in damp situations in the south-west. Its habit is usually open and without pruning it may become untidy and woody at the base. With regular tip pruning, a more compact shrub is obtained.

Leaves are light green, about 2 cm long, more or less linear and taper to a fine point. The orange-red¹ bottle-brush flower spikes grow up to 9 cm long and 5 cm in diameter. They are usually borne on the older wood on small lateral growths. Sometimes flowers are seen close to the ground on very old bushes.

The main flowering period is summer, but some blooms are seen through to autumn and early winter when frost often destroys developing buds. Frost, however, is not an extreme problem as the shrub's vigour is not affected.

Seed is set prolifically on most bushes and the woody capsules persist on the shrub for many years. These may be removed if they look untidy or to improve vigour if the shrub is unthrifty.

By storing the older capsules in a paper bag in a warm place, seeds are quickly released and provide a ready means of propagation. The shrub is also propagated readily from cuttings, using half-hardened wood.

In cultivation, a reasonably well-drained soil and full sun are preferred but *M. lateritia* will survive and give good flowering in most situations. Ample moisture and regular application of a general fertilizer together with an effective mulch provide the ingredients for good culture.

The flowers are often visited by honey-eaters, particularly the eastern spinebill and New Holland honey-eaters in Canberra.

M. lateritia should be grown in a prominent position because of its long flowering period at a time when flowers are scarce in the native garden.

It appears to be relatively free of pests and diseases.

¹RHS Colour Chart, 1966: red group 40B.

THOMASIA PETALOCALYX

Thomasia petalocalyx: *Thomasia*—in honour of Peter and Abraham Thomas, collectors of Swiss plants about 1750; *petalocalyx*—petaloid sepals, an allusion to the calyx lobes which are coloured like petals

Thomasia is a genus of twenty-five relatively unknown Australian species belonging to the family Sterculiaceae which contains about nineteen Australian genera. Plants in this family are usually characterised by having a large, coloured and often attractive calyx, the petals of which are tiny and sometimes absent. *Thomasia* is closely related to another genus of the same family, *Lasiopetalum*, both exhibiting this calyx/corolla relationship. The family also contains such plants as *Brachychiton populneum* (kurrajong) and *B. acerifolium* (flame tree). Another interesting exotic member from which cocoa and chocolate are derived, is *Theobroma cacao* (cocoa tree).

T. petalocalyx, or the paper flower, is widely distributed and thus perhaps better known than many *Thomasia* spp. A native of the drier parts of Victoria, South Australia and Western Australia, it forms a low-spreading shrub with a soft, furry appearance. It usually attains a



height of 80 cm with a spread of about 160 cm. Some specimens could almost be classified as ground covers because of their low, sprawling habit.

T. petalocalyx begins flowering in late October and continues on until January. During this period small sprays of pinkish-coloured flowers¹ cover the branches. These attractive cup-shaped blooms, with their striking brown anthers, are 10-15 mm across. The colourful papery segments of the flower are in fact sepals and are strongly veined. Sepals and petals are both five in number, but the latter are minute and barely noticeable. The sepals are joined close to the base, thus forming a five-lobed calyx. The slender peduncles which support a few drooping flowers are a reddish colour.

The fruit is a three-celled capsule with each cell containing several blackish seeds. Fruits mature quickly, splitting open when ripe and releasing the small seeds. Empty capsules persist on the plant for some time and these should not be mistaken for seeds when seed collecting.

The oblong shaped, crinkly leaves 2-4 cm long have a curved back margin. The leaves, branches and leaf-like stipules are all smothered with small, straight, brownish-coloured hairs.

This species is suited to most reasonably well-drained soils and requires little attention once plants are established. In Canberra Botanic Gardens specimens have survived for ten years and more in a sometimes dry soil. Plants grow equally well in full sun or in a semi-shaded area. The latter situation seems to lengthen their flowering period.

The species may be propagated from cuttings or seed but germination percentage is usually low. Only minimum pruning is necessary to maintain it in a bushy condition and it is ideal for cut flowers.

No diseases or any real damage by insects have been recorded on this species in Canberra Botanic Gardens.

¹RHS Colour Chart, 1966: calyx lobes, outside, purple-violet group 80C; inside, purple-violet group 80D.

Thomasia petalocalyx



BEAUFORTIA SPARSA

The genus *Beaufortia* which is endemic to Western Australia is one of several related genera in the Myrtaceae family which produce bottlebrush flowers.

Beaufortia sparsa is confined to the Albany district of Western Australia where it thrives in swamps which dry out in summer, hence its common name, swamp bottle brush.

Forming a shrub of delicate and open appearance, 1–2 m in height, *B. sparsa* is best in group plantings with individual plants close together. The leaves, up to 1 cm long, are arranged in two pairs of opposite rows. They are dark green and provide an interesting contrast to the bright flowers.

For those who prefer a denser bush, *B. sparsa* responds well to tip pruning. This is best done in spring before new growth starts.

The bottle brush flower spikes, 6–7 cm across and about 6 cm long consist of many stamens. They are the main attraction of this shrub and because they are formed on the younger stems are easily seen. The form growing in Canberra Botanic Gardens is a vivid pinky-orange, though colour can vary from light orange through to deep red.¹

The main flowering period is late summer and autumn and the flowers are a welcome addition to the garden when most other flowers have long since faded. Native honey-eater birds and bees are attracted to this plant and add interest to native gardens.

B. sparsa is available at the more specialised native plant nurseries and may be planted in most situations although a sunny position is best to promote a free-flowering plant. In its native habitat it occurs in poorly drained situations, but in cultivation it does best in a well-drained light soil with periodic fertilising. Growth is moderate in Canberra's cold climate where plants seem to reach their maximum size in five to six years. The species is well able to withstand the severest frosts and can be regarded as frost hardy.

The woody seed capsules remain on the old stems for years and for those with access to



Beaufortia sparsa: *Beaufortia*—in honour of the Duchess of Beaufort (f. 1812), a patron of botany; *sparsa*—from the Latin meaning spread open, scattered

mature plants form a ready source of seed. The mature capsules are removed from the plant and placed in a warm position where the capsules quickly open releasing the fine seed.

Cuttings are also an excellent form of propagation. Tip cuttings taken in late summer and placed on a heated bench with mist will generally produce good results.

Pests and diseases seem to be limited to a small scale insect whose presence is usually first indicated by a black smut which thrives on the insect's excretions. Control is best achieved by a spray of Malathion and white oil. Two applications are sometimes needed for complete control.

¹RHS Colour Chart, 1966, orange-red group 32A.

KUNZEA AMBIGUA

Kunzea ambigua: *Kunzea*—after Gustave Kunze (1793–1851), a German botanist and physician; *ambigua*—from the Latin, doubtful, uncertain (reason for name is obscure)



Kunzea ambigua or tick bush is commonly found growing on the coastal strip and adjacent plateaus of eastern Australia (New South Wales, Victoria, Tasmania), often forming dense thickets.

This genus, which is of the family Myrtaceae, is confined to Australia and is closely allied to *Leptospermum* although it is readily distinguished by its long protruding stamens.

In nature *K. ambigua* is a shrub of variable growth habit reaching a height of about 2–3 m in New South Wales regions where on sandstone and granite-based soils it grows into a rather stiff, upright, spreading shrub with fibrous furrowed bark.

This form has masses of small creamy-white,¹ honey-scented flowers borne in heavy sprays. Masses of spreading stamens concealing the tiny petals give the flowers a fluffy appearance. The flowering period varies between September and early November.

The leaves, small and crowded (about 1 cm long) and narrow-linear in shape, are produced on short stalks. The seed capsules are distinctive, but remain on the plant only until it matures. They are more or less bowl-shaped, often with a rosy bloom. Capsules are divided into several compartments which open by radiating slits in the top to disperse their contents.

A superior form which has been growing successfully in Canberra Botanic Gardens originated from Wilsons Promontory in Victoria. It has a diffuse, sprawling growth habit with stiff, slightly arching branches and appears to be much more floriferous than the NSW form. It may spread to at least 4 m at a height of 1.5 m.

A pink form of *K. ambigua*, the origin of which is obscure, is at present under cultivation in the Botanic Gardens.

This species propagates readily from seed or semi-hardwood tip cuttings taken in late spring through to early autumn. To induce speedier results in striking cuttings a commercial rooting hormone dip may be used.

Little maintenance is required other than an application of a complete fertilizer in early spring and light pruning and shaping to develop a compact, bushy shrub.

A common pest is the webbing caterpillar which may be controlled by physical removal or by an application of Rogor.

Under cultivation *K. ambigua* grows into a handsome shrub which attracts numerous birds and colourful soldier beetles when in flower. It adapts to many situations and may be used as a background shrub, for screening or as a feature plant.

¹RHS Colour Chart, 1966: pink form, red-purple group 68D; white form, orange-white group 159D

ISOPOGON ANETHIFOLIUS

Isopogon anethifolius occurs in the coastal region and Blue Mountains of New South Wales and is one of about six eastern *Isopogon* spp. The common name of drumsticks alludes to the large knob-like fruits which are a feature of the bush.

It is an erect shrub growing to 3 m high by 1.5 m in diameter with terete, much divided glabrous leaves to 16 cm. The bright yellow¹ flowers are crowded in globular heads at the ends of branches in late spring and throughout the summer months. The fruit, of about 2.5 cm in diameter, persists on the plant for a considerable length of time. It is attractive, both on the plant and in floral decorations.

I. anethifolius is hardy in Canberra, best grown in a position with dappled sunlight during summer and in a soil which drains freely. It responds well to annual spring applications of a complete fertilizer and regular deep watering at well-spaced intervals especially while it is becoming established.

Pruning may be effected by pinching out shoot tips each year, but should not be necessary beyond the early years of growth when it is desirable to form the basis of a well-branched shrub. It is normally propagated from seed.

I. anethifolius can be considered a feature plant as it has year-round interest. The fine foliage and reddish stems form a useful contrast to other plants. Its dense growth habit enables it to be used as an effective screen plant. It is free from pests or diseases, being far less susceptible to root-rot fungi than many of the Western Australian species of *Isopogon*.



Isopogon anethifolius: *Isopogon*—from the Greek, isos, equal, and pogon, a beard, referring to the hairs on the fruit; *anethifolius*—from anethum, a plant of the flannel flower family, and folium, a leaf

¹RHS Colour Chart, 1966: yellow-orange group 16A.

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Colour references As in previous volumes colours are identified for the benefit of overseas readers according to both the 1941 and 1966 editions of the colour charts of the Royal Horticultural Society, London.

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Front cover: *Isopogon anethifolius*

Back cover: *Patersonia sericea*

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